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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/639,684	08/15/2000	Dennis H. Runnoe	14374.14	4147

7590 01/09/2003

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EXAMINER

THOMAS, COURTNEY D

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/639,684

Applicant(s)

RUNNOE, DENNIS H.

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 23-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 28-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-22 and 28-56, drawn to an apparatus comprising an integral cathode, classified in class 378, subclass 136.
 - II. Claims 23-27, drawn to a method of making an integral cathode, classified in class 313, subclass 310.
2. Inventions Group I and Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the method of making a cathode can made using a variety of material shaping techniques, such as by heated press, extrusion, etching, etc. The process of manufacture is distinct from the apparatus that will utilize the cathode.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Art Unit: 2882

1. During a telephone conversation with Eric L. Mashoff on Wednesday, December 11, 2002 a provisional election was made without traverse to prosecute the invention of Group 1, drawn to an apparatus comprising an integral cathode as recited in claims 1-22 and 28-56. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-27 (Group 2) - drawn to a method of making an integral cathode are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5-18, 28-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801) in view of Barr (U.S. Patent 4,739,214).

Art Unit: 2882

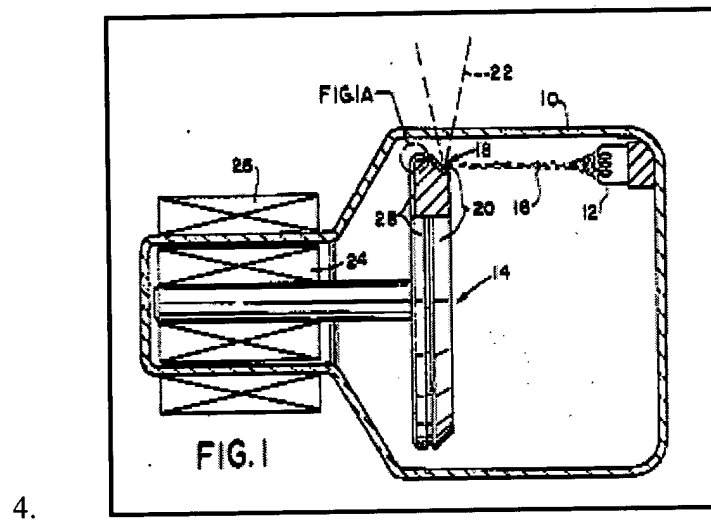


Figure 1 - U.S. Patent 5,264,801 to DeCou, Jr. et al.

5. DeCou, Jr. et al. disclose an x-ray device, comprising: (a) a vacuum enclosure (10), (b) an integral cathode disposed in said vacuum enclosure (note: column 1, lines 14-15 and 17-19, column 2, lines 45-47) said integral cathode including an emitter (12) capable of discharging electrons; (c) a power source (not shown - however, examiner notes that the disclosed device could not operate without a power supply. Additionally, Fig.1, illustrates the emission of electrons upon the application of DC potential; see also column 2, lines 61-65) connected to said emitter so that transmission of power from said power source to said emitter causes said emitter to discharge electrons (column 2, lines 61-65); and (d) a target anode (14) disposed in said vacuum enclosure and having a target surface positioned to receive at least some of the electrons discharged by said emitter.

6. As per claims 1, 5, 28, 29, 30, 44 and 53, DeCou Jr. et al. do not explicitly disclose an emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot.

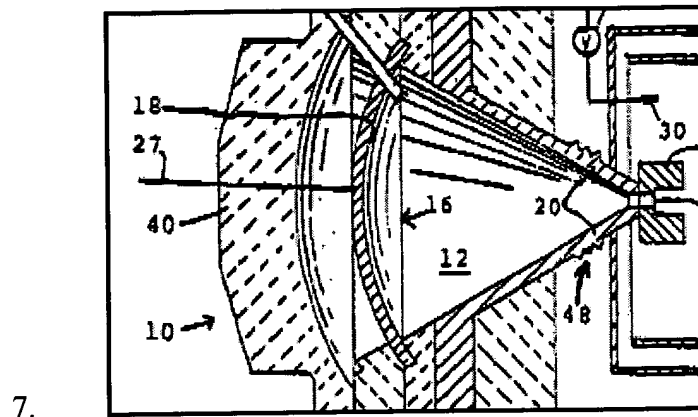


Figure 1 - U.S. Patent 4,739,214 to Barr

8. Barr discloses an emitter (16) having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge at a focal spot (see Fig. 1, above; column 2, lines 63-68). Barr teaches that the shape of the emitter enables electrons emitted from respective portions of the emitting surface (18) to converge to a focal spot while maintaining uniform electron emission.

9. It would have been obvious to modify the apparatus of DeCou, Jr. et al. such that it incorporated an emitter possessing a predetermined geometrical configuration. One would have been motivated to make such a modification so that energetic loss due to erratic electron propagation is minimized and the full power of thermionic emissions are realized, by way of focused radiation as taught by Barr (column 2, lines 63-68).

10. As per claim 2, DeCou, Jr. et al. as modified above, disclose an x-ray device wherein said focal spot (18) is located proximate to said target surface of said target anode (14); (see Fig. 1- to DeCou, Jr. et al.).

11. As per claim 3, DeCou, Jr. et al. as modified above, disclose an x-ray device further comprising a support cartridge (not labeled), said support cartridge receiving said emitter and maintaining said emitter in a desired configuration (see Fig. 1- to DeCou, Jr. et al.).

Art Unit: 2882

12. As per claims 7-9, 11-18, 31-39, 41-43, 45-52 and 54-56, DeCou, Jr. et al. as modified above, disclose an support cartridge receiving an emitter comprising a substantially arc shape (see Barr - 16), a plurality of emitting portions and made of a refractory material (Barr column 3, lines 38-39).

13. As per claims 10 and 40, DeCou, Jr. et al as modified above do not explicitly disclose an emitter composed of a combination of tungsten and rhenium. One would have been motivated to make such a modification, however, for the purpose of providing an emitter having good emissive characteristics and thermal stability when utilized in elevated temperature environments. Additionally, the selection of suitable/ superior (emitter) materials is a well-known practice/ technique in the x-ray tube art.

14. Claims 4 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801) and Barr (U.S. Patent 4,739,214) in view of Knudsen et al. (U.S. Patent 5,515,413).

15. As per claims 4 and 19-22, DeCou, Jr. et al do not explicitly disclose a support cartridge (that) facilitates substantial electrical isolation of said integral cathode. It would have been obvious to a practitioner in the art to provide a support for an integral cathode wherein the support (cartridge) was substantially electrically non conductive. One would have been motivated to make such a modification for the purpose of preventing electrical shorting of the device during operation through inadvertent contact with nearby conductive elements. Additionally, the selection of suitable/ superior insulating materials (i.e. ceramics (alumina, zirconia, etc.) glass, etc. for use in an elevated temperature environment) is a well-known

Art Unit: 2882

practice/ technique in the x-ray tube art (see also Knudsen et al. U.S. Patent 5,515,413 - column 2, lines 32-61).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305 3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas

December 30, 2002


ROBERT H. KIM
SUPERVISOR, PATENT EXAMINER
TECHNOLOGY CENTER 2882